

1 1. A circuit comprising:
2 a converter circuit including first and second input terminals, a rectifier circuit
3 coupled to the first and second input terminals, a resonant inductor, a resonant capacitor,
4 first and second voltage rails, and at least first and second load terminals to energize a
5 load;
6 first and second clamping devices coupled so as to provide a circuit path between
7 the first and second voltage rails; and
8 a first series capacitor having a first terminal coupled to a point between the first
9 and second clamping devices and a second terminal coupled to the first input terminal to
10 provide a feedback path for a feedback current such that a load current has a signal
11 envelope substantially tracking an input voltage signal on the first and second input
12 terminals.

1 2. The circuit according to claim 1, further including a feedback current adjusting
2 component coupled across a first one of the first and second clamping devices.

1 3. The circuit according to claim 1, further including at least one storage capacitor
2 coupled to the first and/or second voltage rails.

1 4. The circuit according to claim 3, wherein a load current splits at the point between the
2 first and second clamping devices into a first clamp current to the first clamping device, a
3 second clamp current to the second clamping device, and a feedback current to the series
4 capacitor.

1 5. The circuit according to claim 4, further including at least one feedback current
2 adjusting component coupled across a first one of the first and second clamping devices
3 such that the load current further splits into a current to the feedback current adjusting
4 component.

- 1 6. The circuit according to claim 5, wherein the feedback current adjusting component
2 includes a capacitor.
- 1 7. The circuit according to claim 1, wherein the first and second clamping devices
2 include diodes.
- 1 8. The circuit according to claim 1, wherein the rectifier circuit includes a voltage
2 doubling configuration having first and second diodes coupled end-to-end across the first
3 and second voltage rails.
- 1 9. The circuit according to claim 1, wherein the rectifier circuit includes a full-wave
2 rectifying circuit and the circuit further includes a second series capacitor to provide a
3 further feedback path from the point between the first and second clamping devices.
- 1 10. The circuit according to claim 9, further including a first bridge diode coupled
2 between the first clamping device and the rectifier circuit and a second bridge diode
3 coupled between the second clamping device and the rectifier circuit.
- 1 11. The circuit according to claim 1, further including a positive temperature coefficient
2 device coupled in parallel with the resonant capacitor.
- 1 12. The circuit according to claim 1, further including an input inductor coupled
2 between the first input terminal and the series capacitor and a blocking capacitor coupled
3 in parallel to the input inductor to form a notch filter corresponding to a frequency of the
4 load signal.
- 1 13. The circuit according to claim 12, further including a first capacitor coupled between
2 the first and second input terminals.

1 14. The circuit according to claim 1, further including a dimming circuit coupled to the
2 circuit.

1 15. The circuit according to claim 1, wherein the circuit includes a ballast to energize a
2 lamp.

1 16. A resonant circuit to energize a load, comprising:

2 a first circuit loop including a first clamping device, a series capacitor, and a first
3 rectifying diode;

4 a second circuit loop including a second clamping device, and a second rectifying
5 diode;

6 a third circuit loop including the first clamping device, first and second load
7 terminals through which load current flows through the load when the load is present, a
8 resonant inductor, and a first switching device;

9 a fourth circuit loop including the second clamping device, the first and second
10 load terminals, the resonant inductor, and a second switching device;

11 a resonant capacitor coupled in parallel with the load when the load is present;

12 a first input terminal coupled to the series capacitor; and

13 a second input terminal coupled to the series capacitor,

14 wherein the load current has a signal envelope substantially tracking an input voltage
15 signal on the first and second input terminals when the load is present and the input
16 voltage signal is present.

1 17. The circuit according to claim 16, further including a fifth circuit loop including the
2 second clamping device and a feedback adjusting element.

1 18. The circuit according to claim 16, further including a fifth circuit loop including the
2 first clamping device and a feedback adjusting element.

1 19. The circuit according to claim 16, further including a fifth circuit loop including the
2 first and second switching devices and first and second storage capacitors.

1 20. The circuit according to claim 16, further including an input inductor coupled
2 between the series capacitor and the first input terminal and a blocking capacitor coupled
3 in parallel with the input inductor such that the input inductor and the blocking capacitor
4 provide a notch filter at a frequency of the load current.

1 21. The circuit according to claim 16, further including a blocking capacitor and a fifth
2 circuit loop including an input inductor, the second rectifying diode, a storage capacitor
3 and a capacitor, wherein the blocking capacitor is coupled in parallel with the input
4 inductor.

1 22. A resonant circuit, comprising:

2 a first circuit loop including first, second, third and fourth rectifying diodes
3 coupled to form a full bridge rectifier;

4 a second circuit loop including the third and fourth rectifying diodes and first and
5 second clamping devices;

6 a third circuit loop including the third rectifying diode, the first clamping device
7 and a first series capacitor;

8 a fourth circuit loop including the fourth rectifying diode, the second clamping
9 device and a second series capacitor;

10 a fifth circuit loop including first and second load terminals to energize a load
11 when present, a resonating inductor, a first switching device, and the first clamping
12 device;

13 a sixth circuit loop including the first and second load terminals, the resonating
14 inductor, a second switching device, and the second clamping device; and

15 a first input terminal coupled to a point between the first and second rectifying
16 diodes and a second input terminal coupled to a point between the third and fourth
17 rectifying diodes,

18 wherein a load current has a signal envelope that tracks an input voltage signal on
19 the first and second input terminals.

1 23. The circuit according to claim 22, further including a device coupled across the
2 second clamping device to adjust a feedback current through the first and second series
3 capacitors.

1 24. The circuit according to claim 22, further including a device coupled across the first
2 clamping device to adjust a feedback current through the first and second series
3 capacitors.

1 25. The circuit according to claim 22, further including a first input inductor coupled
2 between the first input terminal and the point between the first and second rectifying
3 diodes and a first capacitor coupled across the first input inductor and a second input
4 inductor coupled between the second input terminal and the point between the third and
5 fourth rectifying diodes to provide a notch filter having a frequency corresponding to a
6 frequency of a load current.

1 26. The circuit according to claim 22, further including a seventh circuit loop including
2 a storage capacitor, and the first and second switching devices.

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2 27. A resonant circuit, comprising:

3 a first circuit loop including first, second, third and fourth rectifying diodes
4 coupled to form a full bridge rectifier;

5 a second circuit loop including first and second series capacitors and the third and
6 fourth rectifying diodes;

7 a third circuit loop including the first series capacitor, a first clamping device, and
8 a first bridge diode;

9 a fourth circuit loop including the second series capacitor, a second clamping
10 device and a second bridge diode;

11 a fifth circuit loop including the first clamping device, first and second load
12 terminals to energize a load when present, a resonant inductor, and a first switching
13 device;
14 a sixth circuit loop including the second clamping device, the first and second
15 load terminals, the resonant inductor and a second switching device;
16 a first input terminal coupled to a point between the first and second rectifying
17 diodes and a second input terminal coupled to a point between the third and fourth
18 rectifying diodes,
19 wherein a load current has a signal envelope that tracks an input voltage signal on
20 the first and second input terminals.

1 28. The circuit according to claim 27, further including a device coupled across the
2 second clamping device to adjust a feedback current through the first and second series
3 capacitors.

1 29. The circuit according to claim 27, further including a device coupled across the first
2 clamping device to adjust a feedback current through the first and second series
3 capacitors.

1 30. The circuit according to claim 27, further including a storage capacitor coupled to
2 the first and second bridge diodes.

1 31. The circuit according to claim 27, further including a resonant capacitor coupled
2 across the first and second load terminals.

1 32. A resonant circuit, comprising:
2 a rectifying circuit to receive an AC input voltage signal;
3 a feedback path from a load to the rectifying circuit;
4 a feedback clamping means coupled to the load for providing a load current signal
5 having a signal envelope that substantially tracks the input voltage signal.

- 1 33. The circuit according to claim 32, further including at least one storage capacitor
2 coupled to the rectifying circuit.
- 1 34. The circuit according to claim 32, wherein the feedback clamping means includes
2 first and second clamping diodes.
- 1 35. The circuit according to claim 32, further including a notch filter coupled to the
2 rectifying circuit wherein the notch filter has a frequency corresponding to a frequency of
3 the load current signal.
- 1 36. The circuit according to claim 32, further including a series capacitor means coupled
2 between the feedback clamping means and the rectifying circuit.
- 1 37. A method of generating a linear load in a circuit, comprising:
2 coupling a feedback signal representative of a load current signal to a rectifying
3 circuit; and
4 clamping a voltage of the feedback signal to a predetermined level such that a
5 load current signal has an envelope that substantially tracks an input AC voltage signal.
- 1 38. The method according to claim 37, further including coupling first and second
2 clamping devices end-to-end across first and second voltage rails.
- 1 39. The method according to claim 37, further including providing the input AC voltage
2 signal as a dimming signal.